



Measurement of the scCO₂ storage ratio for the CO₂ reservoir rocks in Korea

Minhee Lee (1), Sookyun Wang (2), Jungtaek Kim (1), and Seonok Kim (2)

(1) Pukyong National University, Dept. of Earth Environmental Sciences, Busan, Republic Of Korea (heelee@pknu.ac.kr), (2) Pukyong National University, Dept. of Energy Resources Engineering, Busan, Republic Of Korea

The scCO₂ storage capacity of the reservoir rock under the subsurface was very important factor to determine the optimal CO₂ storage site. The laboratory experiments were performed to measure the amount of the scCO₂, replacing water in pore spaces of the Janggi sandstone and conglomerate, which were considered as available CO₂ storage rocks in Korea. At the scCO₂ injection conditions (100 bar and 50 oC), the scCO₂ storage ratio was calculated as the fraction of the scCO₂ volume in the total pore space of the rock core. To measure the amount of the scCO₂ stored in the Janggi basin reservoir rock after the injection, the dried sandstone or conglomerate core was fixed in the high pressurized stainless steel cell. Water was flushed through the core at 100 bar of the injection pressure for 3 pore volumes of the core to fully saturate the micro pores with water. Then, the scCO₂ was injected into the influent of the cell to replace water in the pore spaces of the core at 110 bar until the pressure of the pore water in the core reached to 110 bar from 100 bar. After more than 3 pore volumes of the scCO₂ was flushed out from the core (the replacement of the scCO₂ was successfully done), the core mass was weighed to measure the amount of water replaced by the scCO₂ in the rock core. From the experiment, the average scCO₂ storage ratio of the Janggi basin reservoir rocks was calculated as 18 %, which can be used to estimate the maximum scCO₂ storage capacity for the Janggi basin sandstone (or conglomerate) layers and also to evaluate the feasibility of the Janggi basin reservoir formation as the scCO₂ storage site. Assuming that the CO₂ storage site is 1,000 m in length, 500 m in width and 30 m in the average thickness of the reservoir layer under 800 m in depth, the scCO₂ storage capacity of the Janggi basin was larger than 200,000 ton, investigating that the Janggi basin has a great possibility as one of the CO₂ injection testing sites on the ground in Korea.